

What is claimed is:

1. An automatic charging system of a robot cleaner comprising:
 - a rotating plate installed at a robot cleaner;
 - 5 an infrared ray receiving unit mounted at the rotating plate and receiving an infrared signal generated from a power supply unit while being rotated;
 - a microcomputer for moving the robot cleaner to the power supply unit on the basis of the received infrared signal; and
 - 10 an ultrasonic generator for generating a stop signal when the robot cleaner nears to the power supply unit,
 - wherein the microcomputer stops movement of the robot cleaner on the basis of the stop signal, and the robot cleaner receives power from the power supply unit according to a control signal from the microcomputer.
- 15 2. The system of claim 1, wherein the power supply unit comprises:
 - a charging unit fixedly installed at a specific region and charging a battery of the robot cleaner; and
 - an infrared ray generator positioned at the charging unit and generating an infrared signal.
- 20 3. The system of claim 1, wherein the microcomputer moves the robot cleaner along the direction in which the infrared signal is generated.
4. The system of claim 1 further comprising:
 - 25 a remaining battery capacity detector for detecting a remaining capacity of

the battery of the robot cleaner, and the infrared ray receiving unit is rotated to receive the infrared signal according to a control signal of the microcomputer if the detected remaining capacity of the battery is below a reference value or when a specific operation of the robot cleaner is terminated.

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5. The system of claim 1, wherein the rotation angle of the infrared ray receiving unit is varied according to the number of infrared ray receiving units installed at the rotating plate.

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6. An automatic charging system of a robot cleaner comprising:
a power supply unit having a charging unit for supplying power and an infrared ray generator for positioned at the charging unit and generating an infrared signal; and
a power receiving unit having a rotating plate installed at the robot cleaner,
15 an infrared ray receiving unit mounted at the rotating plate and receiving the infrared signal while being rotated, a microcomputer for moving a robot cleaner to the charging unit on the basis of the received infrared signal, and an ultrasonic generator for generating a stop signal when the robot cleaner nears to the charging unit,

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wherein the microcomputer stops movement of the robot cleaner on the basis of the stop signal, and the robot cleaner receives power from the charging unit according to a control signal from the microcomputer.

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7. The system of claim 6, wherein the infrared ray receiving unit is installed at the rotating plate mounted at a main body of the robot cleaner.

8. The system of claim 6, wherein the robot cleaner charges a battery installed therein by receiving power from the charging unit according to a control signal of the microcomputer.

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9. The system of claim 6, wherein the microcomputer moves the robot cleaner along the direction in which the infrared signal is generated.

10. The system of claim 6 further comprising:

10 a remaining battery capacity detector for detecting a remaining capacity of the battery of the robot cleaner, and the infrared ray receiving unit is rotated to receive the infrared signal according to a control signal of the microcomputer if the detected remaining capacity of the battery is below a reference value or when a cleaning operation of the robot cleaner is terminated.

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11. The system of claim 6, wherein the rotation angle of the infrared ray receiving unit is varied according to the number of infrared ray receiving units installed at the rotating plate.

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12. An automatic charging system of a robot cleaner comprising:

a power supply unit having a charging unit fixedly installed to charge a battery and an infrared ray generator positioned at the charging unit and generating an infrared signal; and

25 a power receiving unit having a battery installed at the robot cleaner and charged by the charging unit, a remaining battery capacity detecting unit for

detecting a remaining battery capacity, a rotating plate mounted at a main body of the robot cleaner, an infrared ray receiving unit mounted at the rotating plate and rotating to receive the infrared signal if the detected remaining battery capacity is below a reference value, a microcomputer for moving the robot cleaner to the 5 charging unit along the direction that the infrared signal is generated, and an ultrasonic generator for generating a stop signal when the robot cleaner nears to the charging unit,

wherein the microcomputer stops movement of the robot cleaner on the basis of the stop signal and charges the battery.

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13. The system of claim 12, wherein the rotation angle of the infrared ray receiving unit is varied according to the number of infrared ray receiving units installed at the rotating plate.

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14. An automatic charging method of a robot cleaner in which an infrared signal is generated to induce a robot cleaner to a power supply unit for supplying power to charge the robot cleaner, comprising:

rotating an infrared ray receiving unit of a rotating plate mounted at a main body of a robot cleaner when the robot cleaner is in a charge mode;

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receiving an infrared signal generated from a power supply unit and detecting a direction of the power supply unit on the basis of the infrared signal received through an infrared ray receiving unit;

moving the robot cleaner along the detected direction;

generating a stop signal when the robot cleaner nears to the power supply

25 unit;

stopping movement of the robot cleaner on the basis of the stop signal;
and

docking a power terminal of the robot cleaner and a charge terminal of the power supply unit when the robot cleaner is stopped.

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15. The method of claim 14, wherein, in the step of moving the robot cleaner, the robot cleaner is moved along a direction in which the infrared signal is generated.

10 16. The method of claim 14, wherein, in the step of rotating the infrared ray receiving unit, the rotation angle of the infrared ray receiving unit is varied according to the number of infrared ray receiving units installed at the rotating plate.